

# MATTEL ELECTRONICS

10:00 A.M. REVIEW AGENDA  
10:10 A.M. INTELLIVISION VIDEO TAPE  
10:30 A.M. OVERVIEW AND GENERAL DISCUSSION  
11:00 A.M. DEMONSTRATION OF CARTRIDGES AND CASSETTES  
12:00 NOON LUNCH  
1:00 P.M. TECHNICAL DESCRIPTION OF SYSTEM  
1:30 P.M. MASTER COMPONENT PRODUCTION STATUS  
2:00 P.M. KEYBOARD COMPONENT HARDWARE STATUS  
2:30 P.M. WRAP-UP

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# MATTEL ELECTRONICS

CASSETTE PROGRAM STATUS - OCTOBER 24, 1979

BEING DEBUGGED

1147 - BERLITZ CONV. FRENCH	IN STORE DEMO CASSETTE	AVAILABLE 12-10-79
1146 - JACK LALANE EXERCISE		AVAILABLE 12-27-79
1153 - FOOD & DIET		AVAILABLE 1-14-80

PLANNED FOR NEXT YEAR:

CONVERSATIONAL SPANISH	
EARLY READING	
COOKING	
YOGA	
DISCO DANCING	
MUSIC	
ART	
TAX	



## TECHNICAL DESCRIPTION OF THE INTELLIVISION SYSTEM

Intellivision is a modular system which can be purchased one component at a time. The central portion of the system is the Master Component which is a sophisticated video game that provides enduring individual or family entertainment. When combined with the Keyboard Component, the combination becomes a powerful, versatile, expandable home computer. Its low power requirement (approximately 20 watts for the Master Component, and 40 watts for the Keyboard Component) makes it an energy conserving form of entertainment and utility.

### MASTER COMPONENT

The Master Component is a video game system which interfaces to the customer's television system. The modulator for this interface is built into the Master Component. The desired game is selected by plugging in the cartridge for that game, selected from the variety of software available.

**Controls:** The controls of the Master Component are quite simple. There is a power on/off switch and a reset button on the Master Console. All the rest of the controls are in the two handheld controllers. These are versatile controllers; each of which contains a 12 key keypad, a 16 direction control pad, and 4 action buttons. Each game is supplied with a set of plastic overlays which slide into the hand controllers, over the keypad, to relabel the keys appropriately for that particular game.

#### Graphics Capabilities:

16 colors

Background resolution: 96 lines (2 T.V. lines per data line),  
160 pixels each

8 moving objects - each 8 x 16 pixels - programmable resolution  
as high as one T.V. line per data line  
and horizontal pixel size the same as  
the background. Moving objects have  
capability of high degree of animation.

Alpha-numerics: 12 rows of 20 characters each. Any color for  
any character.

**Sound Generator:** Intellivision Master Component contains a versatile sound generator capable of producing three different tones simultaneously along with a pseudo-white noise. With this capability sounds all the way from three part harmony to rather complex general sounds can be generated under program control.

**Internal Memory:** In addition to the several sections of memory utilized in displaying graphics on the T.V. screen, the following internal memory greatly enhances the program effectiveness of the game cartridges:

Scratch pad RAM: 112 words by 16 bits  
256 words by 8 bits

Executive ROM: 4K by 10

Graphics ROM: 2K by 8

Graphics RAM: 512 by 8

# MATTEL ELECTRONICS

## KEYBOARD COMPONENT HARDWARE

PRESENTLY MECHANIZED ON 5 P.C. BOARDS

- COMPUTER ASSEMBLY
- HIGH RESOLUTION ALPHANUMERIC ASSEMBLY
- PREAMP ASSEMBLY
- TAPE CONTROL ASSEMBLY
- POWER SUPPLY ASSEMBLY

## PLANNED REVISIONS

CIRCUIT SIMPLIFICATIONS WHICH ALLOW COMPUTER ASSEMBLY AND HR ALPHANUMERIC ASSEMBLY TO BE MERGED INTO A SINGLE BOARD - IN WORK  
INTERCHANGEABLE, COST REDUCED, REDESIGN - 1980



MAJOR ELECTRONICS ASSEMBLIES

FUNCTION	LOWER HOUSING	UPPER HOUSING	LOOSE EQUIPMENT
Power	Transformer Assy. (1149-9269)  Power Supply Assy. (1149-9249)		
Control		Computer Assy. (59) (1149-9229)  Tape Control Assy. (18) (1149-9239)  HR Graphics Assy. (42) (1149-9329)	
I/O			Tape Deck Assy. (1149-9129)  Microphone (1149-2499)  Cassette Drive (1149-4129)  RF Adapter (1149-9059)  Pre Amp Assy. (3) (1149-9199)  Keyboard Assy. (1149-9349)

# MATTEL ELECTRONICS

## KEYBOARD COMPONENT HARDWARE STATUS

HOUSING TOOLING COMPLETE

KEYBOARD AND CASSETTE MECHANISM IN PRODUCTION

POWER SUPPLY, PREAMP AND TAPE CONTROL ASSEMBLY IN PRODUCTION

LOGIC BOARDS IN PRODUCTION

SOFTWARE IS PROGRAMMED AND BEING DEBUGGED WITH WORKING HARDWARE



March 5, 1980

SUBJECT: Intellivision Peripherals

BY: Dave Chandler

#### 40-COLUMN PRINTER

The peripheral that is planned for the Intellivision system is a low cost 40-column printer. It is intended to be used for the purpose of documenting either the information that is on the screen from any programs being used on the Keyboard Component or it can be used to print out information which is stored internally in the system.

It will also have the capability of printing out graphics pictures in that it will be a DOT matrix printer and, therefore, can print out any picture which has been created on the screen. It will, of course, be black and white only so any color content from the screen would be lost.

It is expected that this printer will be in the price range of \$100 A for the US market and will be a 1981 product.

The print mechanism will be purchased from a supplier - probably Olivetti. The rest of the system either we will engineer and assemble or get a subcontractor to assemble or, depending on how negotiations turn out, we might well have the supplier of the mechanism also build the custom designed unit for us. It will have to be a custom unit to some extent in that it will need the logic and circuitry to interface with the expansion terminal for the Intellivision system. The housing designed for the system will be done by Mattel in order to have it match aesthetically the Intellivision system and obviously be a part of the component system.

#### PHONE MODEM

One of the very important peripherals for Intellivision is the phone modem. This will provide the interface between Intellivision and the telephone line which in turn provides access to such things as central computer systems, viewdata, central data bank, electronic banking, electronic purchasing, etc. It is envisioned that the modem for Intellivision will be of a configuration to tie directly to the telephone line and will not include an acoustic coupler. This will permit the system not only to be simpler and more reliable but at a lower cost. It is envisioned that the normal interconnection will be to the new modular type telephone systems within the United States which will permit unplugging a cable to a modular telephone and plugging it in to the modem and in turn plugging the cable from the modem into the telephone set. This would permit the telephone to be used on line for applications in which that was desirable and also provides a very simple means of coupling the modem to the telephone system. This would result in a very small unit which plugs into the expansion port of Intellivision and will contain a socket into which the modular telephone cable plugs and will have a telephone type cable extending from it which can plug into the telephone receiver. The box will be something on the order of 4 inches x 4 inches x 2 inches thick and will have a minimum of controls built into it (probably one or two push buttons for activation or turning the power ON and OFF).

## VOICE PERIPHERALS

At present, two versions of voice peripherals are envisioned. The first and simplest will be voice synthesis which will permit the generation of speech from digital data. Because it is expected that one of the primary uses of the voice peripherals will be in game play with the Master Component, these peripherals are envisioned as units to plug into the cartridge slot of the Master Component (or Keyboard Component) and provide a second cartridge slot into which the game cartridges can be plugged. In the case of the voice synthesis only, there would be no additional switches or connections to this box except possibly a power connection. The box would contain the necessary circuitry to generate voice signals from the digital data supplied to it. The voice signal would be fed into the master component and out to the television set. It would be heard from the speaker in the television set. There probably will be some limited resident library of sounds such as numbers but the primary source of the digital data to be converted into sound will be part of the game cartridge plugged into the peripherals. It is envisioned that a series of super cartridges will be used in connection with the voice peripheral which will provide not only more sophisticated game play but the computer generated speech segments to go along with that particular game.

A later version of the voice peripheral will include voice recognition along with the voice synthesis. In this situation, voice commands will be given to the system thru the two microphones which will be supplied with this peripheral and be interpreted as commands for the particular game involved. Again, the data which is necessary to interpret the voice inputs will be provided as part of the individual game cartridge and as such will again be part of a super cartridge. This will permit the development of games in which the actions of the game play can be commanded by voice commands as opposed to requiring that the hand controllers be used to control the game play. For example, in the Black Jack game, the decision as to whether to "hit" or "stay" would be transmitted to the system simply speaking the word "hit" or "stay" into the microphone --- or in something like a Chess game, men could be moved by commands such as "rook to pawn 4".

## REMOTE ANTENNA

Consideration is being given to a peripheral which would permit elimination of the antenna cable connection between Intellivision and the television set. This would be a small transmitter unit which would plug into the socket on the Master Component where the antenna cable normally is plugged. At the television end, the antenna switch box would be replaced by a small receiver box of about the same size which would receive the modulated signals transmitted by the transmitter plugged into the Intellivision system. This peripheral offers the advantage of eliminating the antenna cable which otherwise must be connected between the Intellivision and the television set but it also provides more flexibility in the positioning of the Intellivision console relative to the television set. This peripheral would probably wind up in a price range of around \$25 A.

## REMOTE CONTROLLERS

A similar peripheral would be that of remote controllers in which the hand controllers are detached from the Master Component. This would eliminate the limitations of proximity of the controllers to the Master Component and therefore permit more freedom in the arrangement of the component in the home.

This peripheral requires a modification in the Master Component to plug in the receiver element in place of the hand controllers. The hand controller itself would be very similar to the present hand controller except that there would be no cable attached to it and the unit would contain a battery, some circuitry and a small infrared transmitter.

Because the receiver portion of the remote controller must be connected internally to the Master Component, this cannot be a peripheral in the true sense in that it would not be expected that the customer could install a modification kit for instance. It would be feasible to have the GE repair center modify existing systems to incorporate this feature. As far as configurations of new systems, decisions will have to be made based on cost tradeoffs as to whether the remote hand controller would be kept as a modification option or whether all new systems would be built with the remote control built in or whether two versions were made available to the customer.

#### BASIC LANGUAGE CARTRIDGE

While this may not be thought of in the normal sense of a peripheral, in reality, it has most of the characteristics of a peripheral. It will be a cartridge which plugs into the expansion port of the Master Component to provide the ability to write and operate basic language programs on the keyboard system. The initial version of this will be essentially equivalent to the basic language available on other home computers. It is expected that a later version will enhance this cartridge significantly in the area of utilization of the rich graphics capabilities which Intellivision has. The Basic language cartridge will permit the user to create his own software packages to do any of a variety of things such as a program to maintain an inventory of his stamp collection or do programs that he would use in his business or simply to generate some special computational program to solve particular problems that he may be wanting to do. Perhaps more importantly, it will permit the user to become familiar with the process of writing computer programs.

#### FULL PAGE PRINTER

A longer range consideration is that of a full page printer. If we can find a means of getting such a printer at a price low enough to be practical in the home environment, there are a variety of advantages such a printer would provide. These include such things as printing out directly on tax forms instead of requiring hand translation to the tax forms. It would make possible a low cost word processor suitable for the home environment which would permit unskilled typists to generate error-free letters and other documents.

#### RS232 INTERFACE

Many data processing peripherals are available with interface circuitry and connections compatible with the RS232 standards. An adapter could be made which would permit connecting these peripherals to Intellivision. Such an adapter would plug into one of the Keyboard Component expansion ports and would have either (or both) a built-in RS232 connector or a cable with an RS232 connector on the end. The adapter would contain on the order of half a dozen IC's, so it could be rather small - perhaps directly plugging into the Keyboard Component rather than being cable connected.